REMARKS

Claims 14, 23-24, 30, 32-35, 42-58 (Withdrawn), and 59 (New) are pending herein.

1. A change in correspondence address and new power of attorney shall be filed with the USPTO shortly. The undersigned has undertaken a detailed review of the entire prosecution history of the present application and respectfully submits that the invention as now claimed clearly defines over the art of record for the reasons discussed in more detail below.

2. Claims 14, 23, 33-35 were rejected under §102(b)/§103 over JP '974. Additionally, claims 14, 23, 33 and 34 were rejected under §102(b)/§103 over JP '360. These rejections are respectfully traversed for the following reasons.

The claimed invention is drawn to an article comprising recrystallized silicon carbide, having a large pore size (at least about 15 μm), a notably low surface area (less than about 0.04 m^2/g), and having a low impurity content (impurity concentration less than about 200 ppm), enabling use of the article in the context of semiconductor manufacture. The claimed combination of features are of vital significance, best explained through a review of a the processing details for forming the claimed article.

The claimed article is drawn to a specific type of silicon carbide body, namely recrystallized silicon carbide. Recrystallized silicon carbide differs from other types of silicon carbide bodies or articles as being characterized by a process flow in which generally a body of bimodal particle size silicon carbide powder is formed, followed by heat treatment to cause grain growth of the larger particles, at the expense of or consumption of the smaller particles. This particular type of process flow results in a characteristic recrystallized morphology, but does not generally result in marked changes in density, in contrast to conventional sintering processing. In an effort to improve the effectiveness of the claimed recrystallized silicon carbide article for demanding semiconductor applications, the article has been engineered to have large pore size and low surface area in order to reduce the transfer of impurities to the article to semiconductor wafers during processing. Additionally, a desirably low surface area improves resistance to degradation during use, due to the reduced exposed surface area to high temperature processing operations. According to embodiments herein, the claimed morphology is manifested through a

processing operation in which heat treatment to recrystallize the silicon carbide body is carried out at temperatures higher than those generally utilized in recrystallization of process flows, such as on the order of 2200°C to about 2500°C. This resulting morphology may be clearly seen in present FIG. 12, showing a "globular" or "nodular" structure characterized by an interconnected solid mass having notable porosity, the pores being defined by generally smooth surfaces. Those smooth surfaces are quantified in terms of pore surface area less than about 0.04 m^2/g, as noted above.

Further, the claimed invention calls for an impurity concentration less than about 200 ppm. This feature is also of notable significance, and in the context of the claimed recrystallized silicon carbide, has been achieved by embodiments through pressure reduction during high temperature treatment. By way of example only, as reported in connection with Example 2, during heat treatment at 1850°C, a pressure of 0.8 atm (600 Torr) resulted in impurity concentrations of Fe and Ni well in excess of 400 ppm, while reduction to 0.008 atm (6 Torr), representing a two order of magnitude reduction in pressure, reduced impurity content to less than 3 ppm.

Turning to the applied prior art, JP '974 apparently refers to a recrystallized silicon carbide heater, having a mean pore radius within a range of 15 to 40 μm. Page 2 of the English-language machine translation provided by the PTO teaches that the heater is formed through a process by heat treatment at 2500°C. Similarly, JP '630 appears to be drawn to a recrystallized silicon carbide heater having a mean pore radius on the order of 20 to 40 μm. Page 3 of the English-language machine translation provided by the PTO teaches that the heater is formed through heat treatment at 2200°C.

Applicants respectfully submit that the claimed impurity content is not inherent in the disclosures of the JP references, and further, that it would not have been obvious to somehow modify the disclosure of the references to achieve the claimed impurity concentration.

With respect to inherency, the JP references do not disclose impurity levels of the raw materials, the use of inherently pure (semiconductor grade) raw materials, or the use of low pressure processing to achieve impurity reduction. Accordingly, one cannot reasonably conclude that the references have claimed impurity levels, and indeed, one of ordinary skill in the art

would conclude the opposite, since the disclosed heaters are used in non-semiconductor applications, namely in the context of exhaust gas systems (to volatilize soot from diesel engines) or soldering applications. Further, given the distinct art areas to which the claimed invention and that of the prior art are drawn, one of ordinary skill in the art, would not have been motivated to reduce impurity levels to ppm levels. Highly pure raw materials are expensive; clearly one of ordinary skill in the art of exhaust gas heaters or soldering devices has little concern with ppm levels of Ni, Fe, Cu, Cr, Ca that could partly migrate into an exhaust gas stream or soldering environment.

Furthermore, Applicants submit that claims 24 and 30 recited even further patentable subject matter over the JP references, reciting that the article is in the form of a wafer boat.

For at least the foregoing reasons, in view of the amendments to the present claims, reconsideration and withdrawal of the §102/§103 references over the JP references are respectfully requested.

3. Claims 14, 23, 30 and 32-35 were rejected under §102/§103 over Dubots et al. This rejection is respectfully traversed for the following reasons.

The disclosure of Dubots et al. is entirely distinct from that of the claimed invention, drawn to a large pore size, low surface area recrystallized silicon carbide article. The disclosure of Dubots et al. is directed to a converted graphite structure, in which graphite is reacted with silicon to form silicon carbide. The thus formed converted graphite article, which is taught by Dubots et al. as being a commercially sourced Poko Graphire SUPERSIC material, is then subjected to silicon infiltration. Dubots et al. clearly show an example of the Poko Graphire SUPERSIC material, namely the converted graphite material, in FIG. 1 (prior to silicon infiltration). FIG. 1 of Dubots et al. should be contrasted against FIG. 12 of the present application, demonstrating morphologies that are essentially polar opposites of each other. Specifically, the converted graphite material has a high surface area, characterized by highly irregular, non-smooth pore surfaces. Accordingly, while the PTO has relied upon the intermediate product of Dubots et al. in an attempt to meet the features of the claimed invention, that product clearly does not have the claimed low surface area. Further, there is no teaching or

suggestion of how to even modify the morphology of the converted graphite material to have the claimed surface area.

For at least the foregoing reasons, Applicants respectfully submit that the claimed invention is novel and non-obvious over Dubots et al. Accordingly, withdrawal of the §102/§103 rejection over Dubots et al. is respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to telephone Applicants' undersigned representative at the number listed below.

The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

5/21/08
Date

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